

Figure x: Central Coast





type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	<i>None in this region</i>
Federal (Project)	
State (Project)	
Local (Project)	
Local Imports	<i>None in this region</i>
Groundwater	

Figure x: Colorado River






type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	
Federal (Project)	<i>None in this region</i>
State (Project)	
Local (Project)	
Local Imports	
Groundwater	

Figure x: North Coast




type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	<i>None in this region</i>
Federal (Project)	
State (Project)	<i>None in this region</i>
Local (Project)	
Local Imports	<i>None in this region</i>
Groundwater	

Figure x: North Lahontan



type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	<i>None in this region</i>
Federal (Project)	<i>None in this region</i>
State (Project)	<i>None in this region</i>
Local (Project)	
Local Imports	<i>None in this region</i>
Groundwater	

Figure x: South Coast







type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	
Federal (Project)	
State (Project)	
Local (Project)	
Local Imports	
Groundwater	

Figure x: San Francisco






type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	<i>None in this region</i>
Federal (Project)	
State (Project)	
Local (Project)	
Local Imports	
Groundwater	

Figure x: San Joaquin





type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	<i>None in this region</i>
Federal (Project)	
State (Project)	
Local (Project)	
Local Imports	<i>None in this region</i>
Groundwater	

Figure x: South Lahontan



type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	<i>None in this region</i>
Federal (Project)	<i>None in this region</i>
State (Project)	
Local (Project)	<i>Data forthcoming</i>
Local Imports	<i>None in this region</i>
Groundwater	

Figure x: Sacramento River

type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	None in this region
Federal (Project)	💡
State (Project)	💡💡
Local (Project)	💡
Local Imports	None in this region
Groundwater	💡

Figure x: Tulare Lake

type of water	energy intensity (💡 white bulb = 0; 💡 yellow bulb = 1-500 Kwh./AF)
Colorado (Project)	None in this region
Federal (Project)	💡
State (Project)	💡
Local (Project)	💡
Local Imports	None in this region
Groundwater	💡

What are the Expected Impacts from These Changes?

Climate change is already having a profound effect on California's water resources as evidenced by changes in snowpack, river flows, and sea levels. Scientific studies show these changes will increase stress on the water system in the future. Because some level of climate change is inevitable, the water system must be adaptable to change.

The impacts of these changes will gradually increase during this century and beyond. California needs to plan for water system modifications that adapt to the following impacts of climate change:

Water Supply

Changes in river flow impacts water supply, water quality, fisheries, and recreation activities.



A reduction of snowpack will change water supply



Ecosystem

Forests, important contributors to water supply and quality, will be more vulnerable to pests, disease, changes in species composition, and fire.



Increases in water temperature and reductions in cold water in upstream reservoirs may hurt spawning and recruitment success of native fishes.



Lower streamflows will tend to concentrate urban and agricultural runoff, creating more water quality problems.



Water & Power Operations

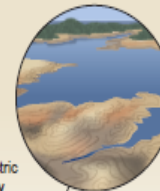
Operation of the water system for urban, agricultural, and environmental water supply and for flood management will become increasingly difficult because of the decisions and trade offs that must be made.



California's hydroelectric power generation may be less reliable; at the same time, higher air temperatures may increase energy consumption through increased use of air conditioning.



Water supply reliability will be compromised.

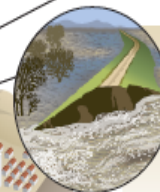


Warmer temperatures will affect water demands.

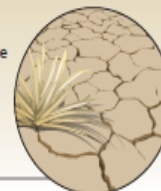


Flooding & Drought

Increased flooding potentially causes more damage to the levee system.



Higher temperatures and changes in precipitation will lead to droughts.

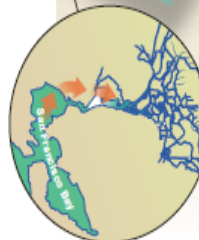


Coast & Delta

Higher water temperatures will make the Delta intolerable to some native species and also more attractive to some non-native invaders that may compete with natives.



Increased salinity in the Delta will degrade drinking and agricultural water quality and alter ecosystem conditions.

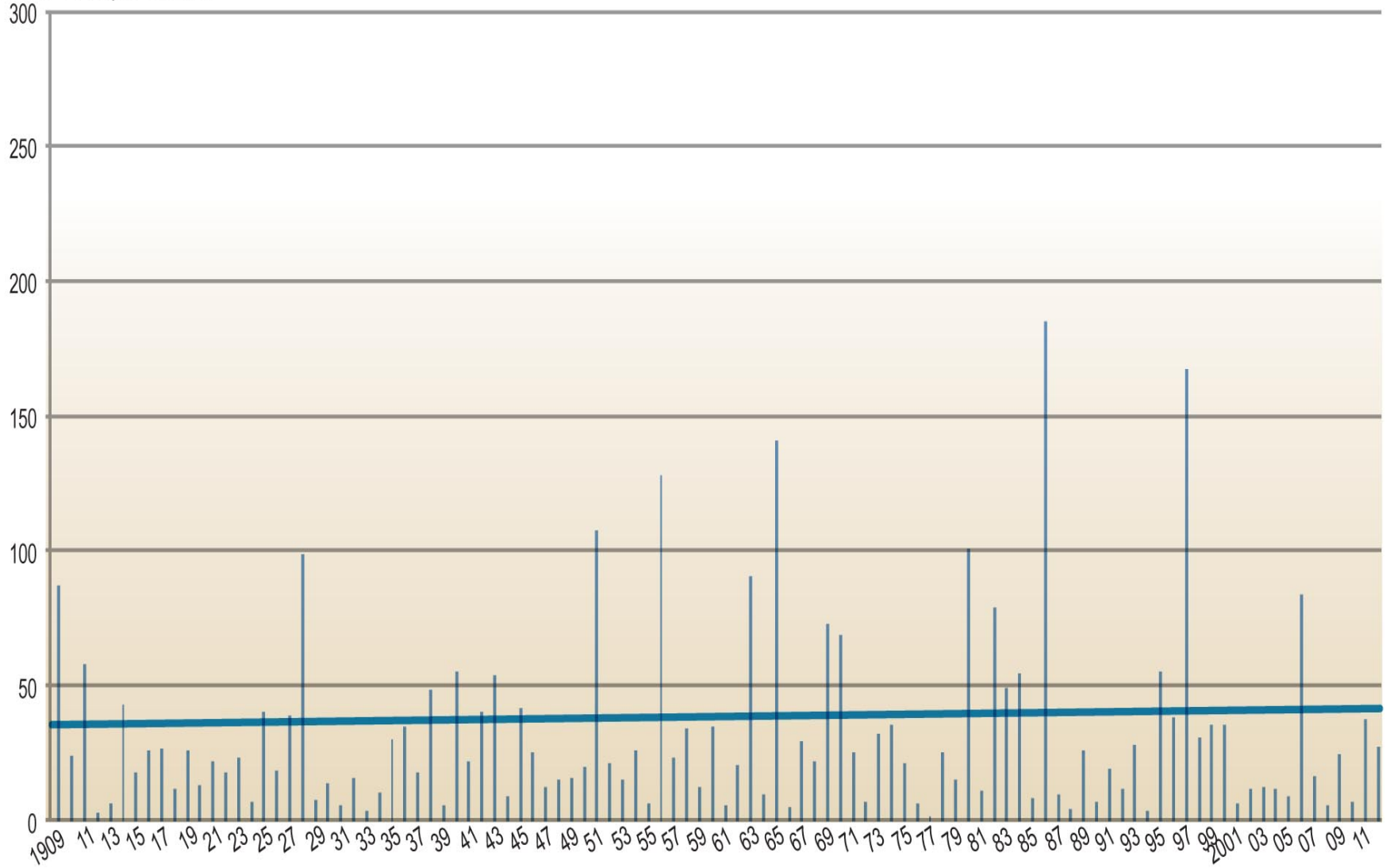


Sea level rise threatens coastal communities and infrastructure, in particular, the water system in the Sacramento-San Joaquin Delta where the existing Delta levees were not designed or constructed to withstand these higher water levels.



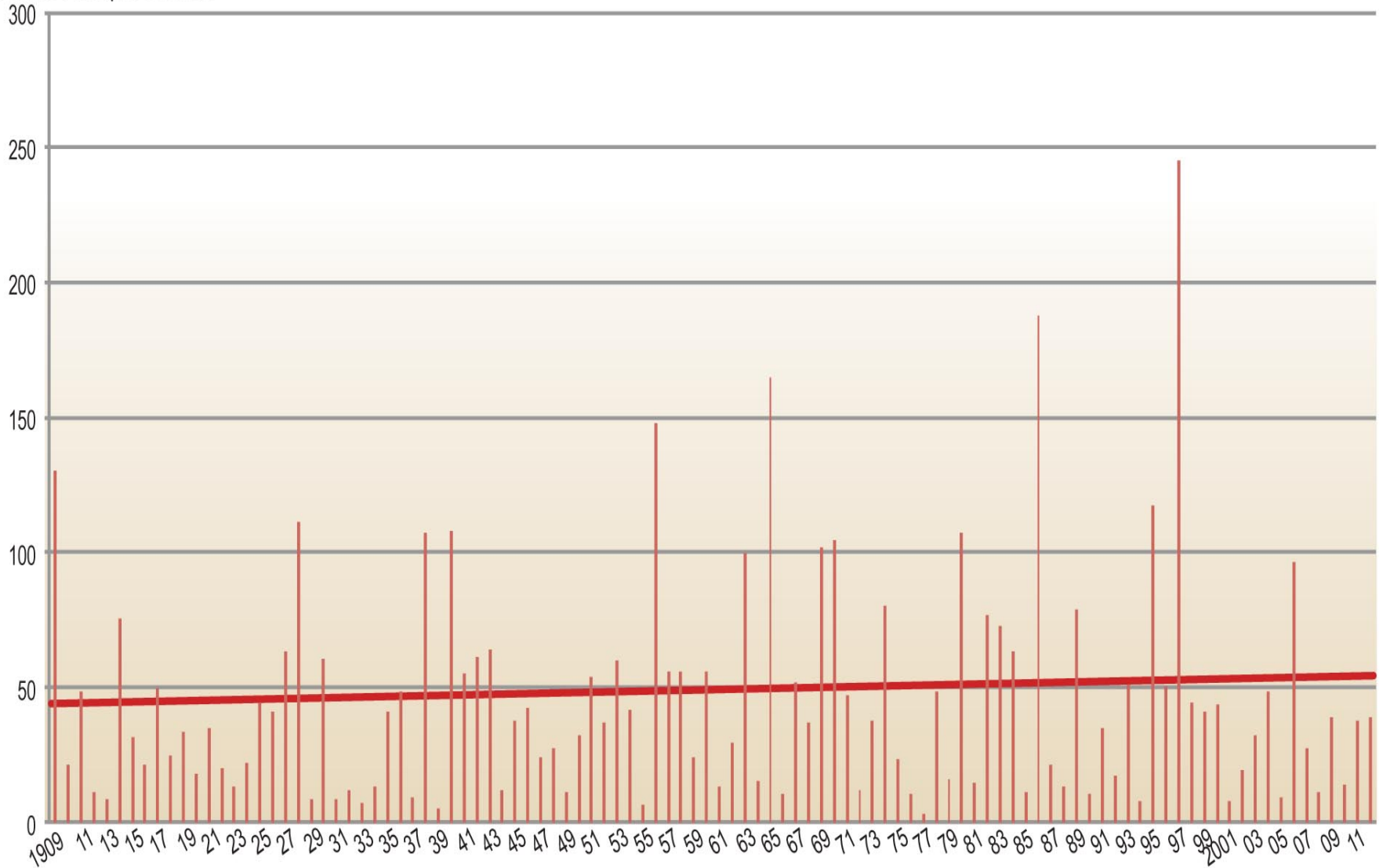
American River: 3-Day Maximum Flows

Thousand Cubic Feet per Second



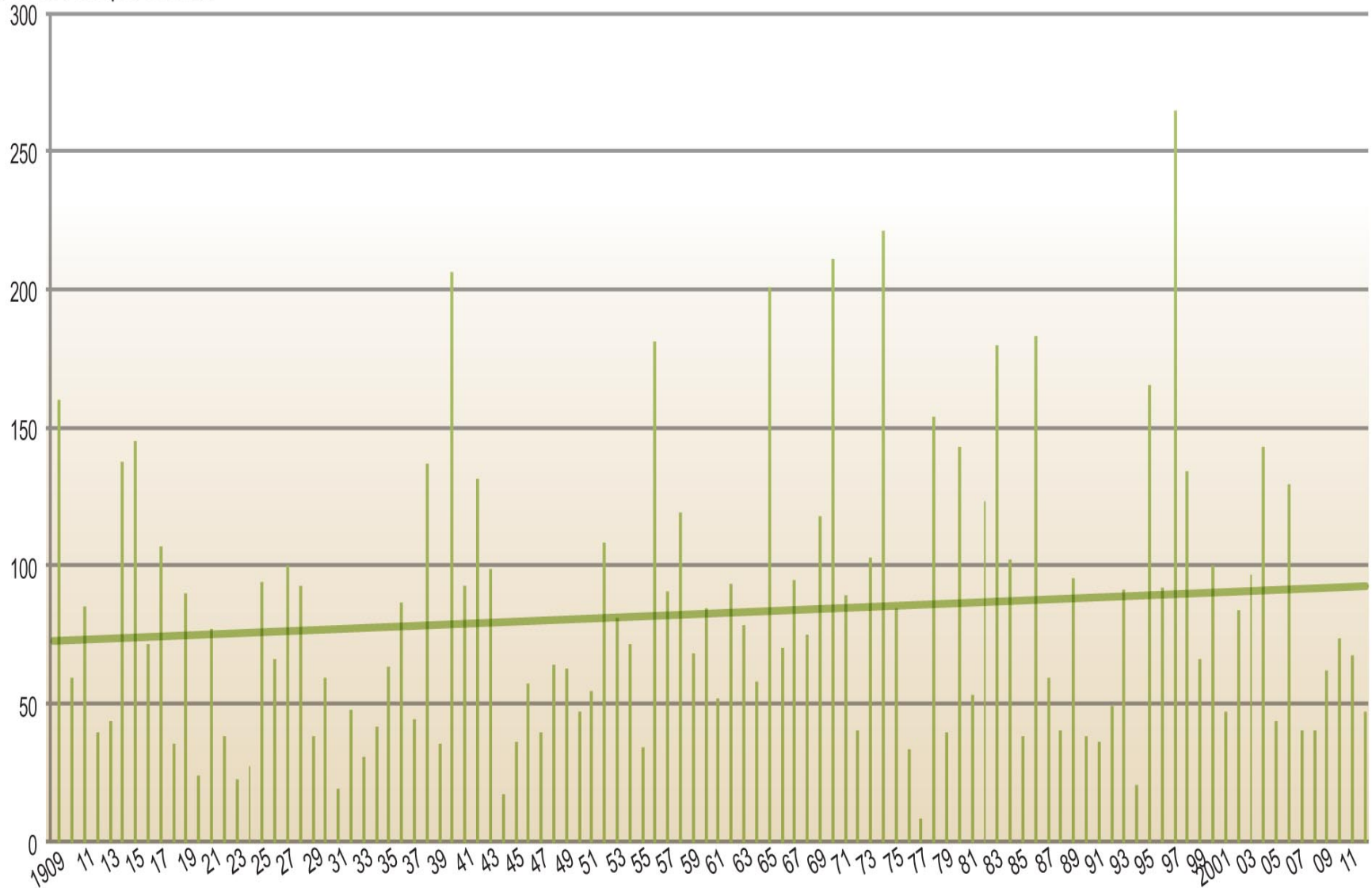
Feather River: 3-Day Maximum Flows

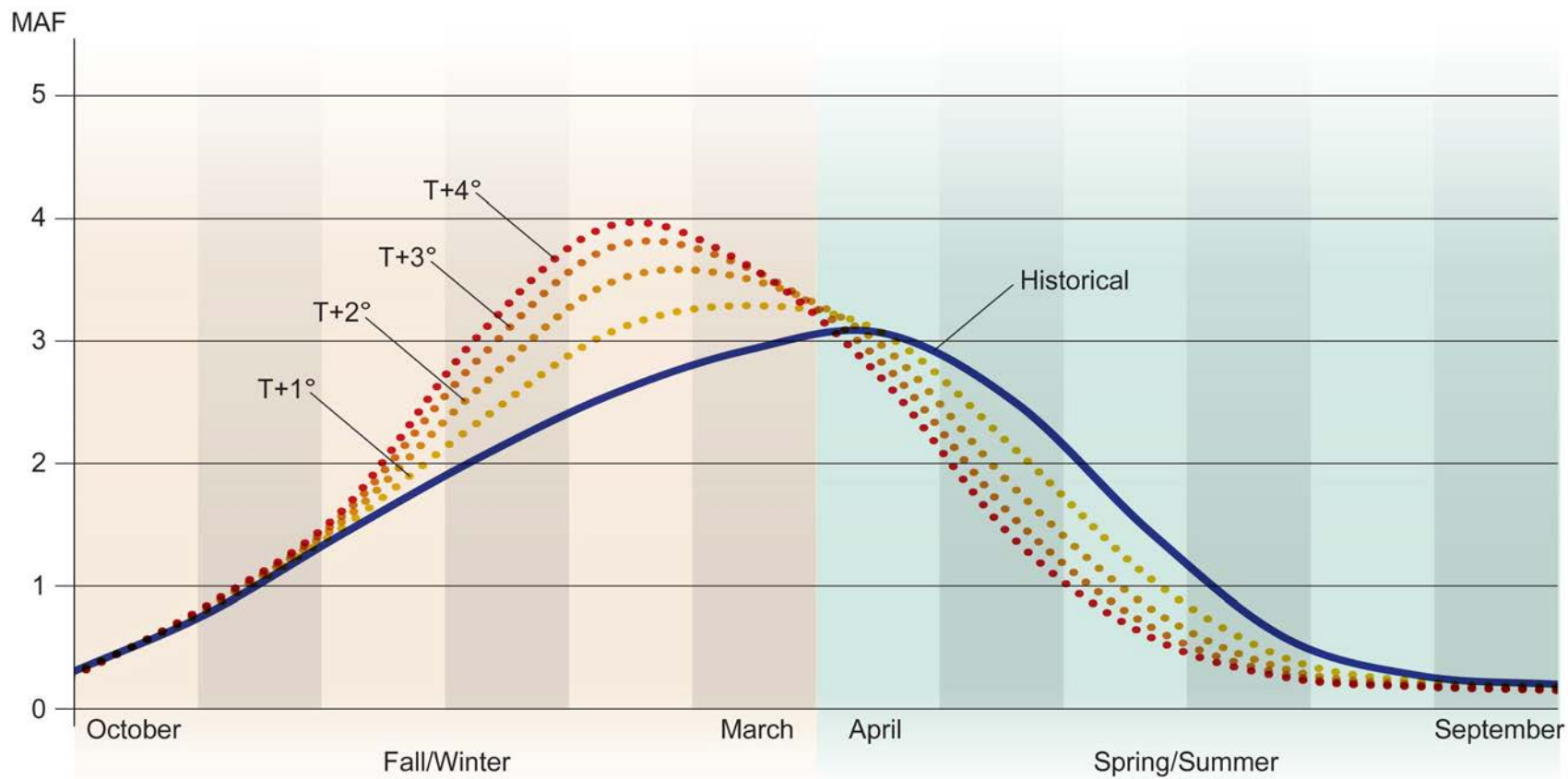
Thousand Cubic Feet per Second

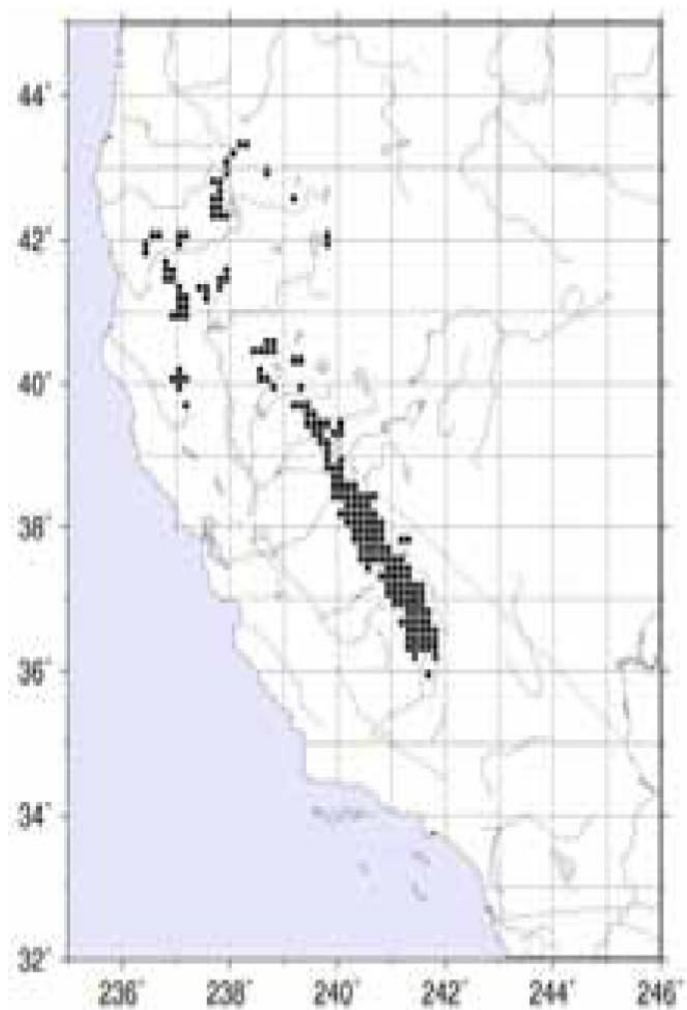


Sacramento River: 3-Day Maximum Flows

Thousand Cubic Feet per Second







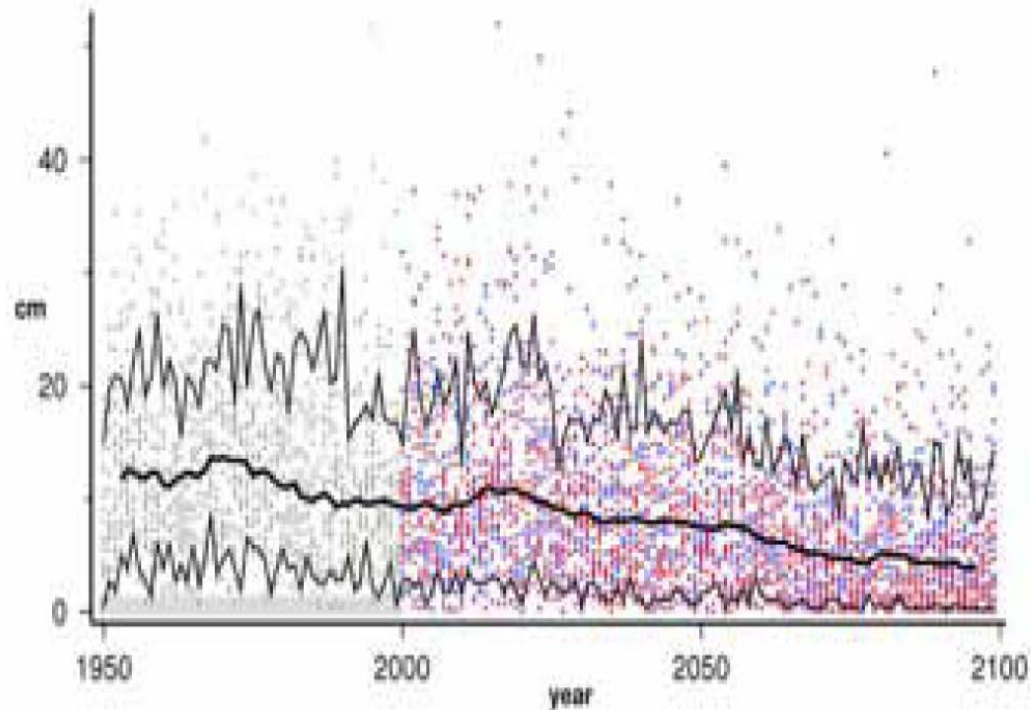
California April 1 SWE from climate simulations

32 BCSD (16 SRESA2 and 16 SRESB1)

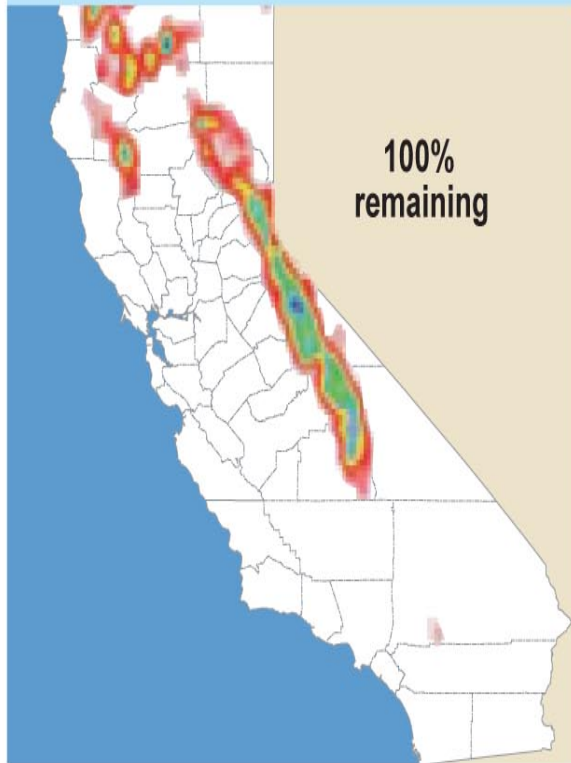
7-year smoothed median: heavy black line

90th and 10th percentiles: light black lines

- SRESA2
- SRESB1
- historical

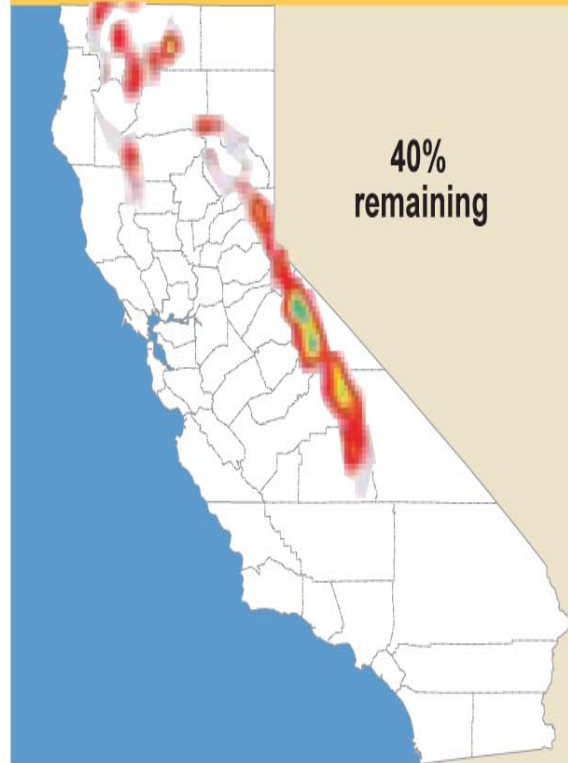


Historical Average (1961–1990)

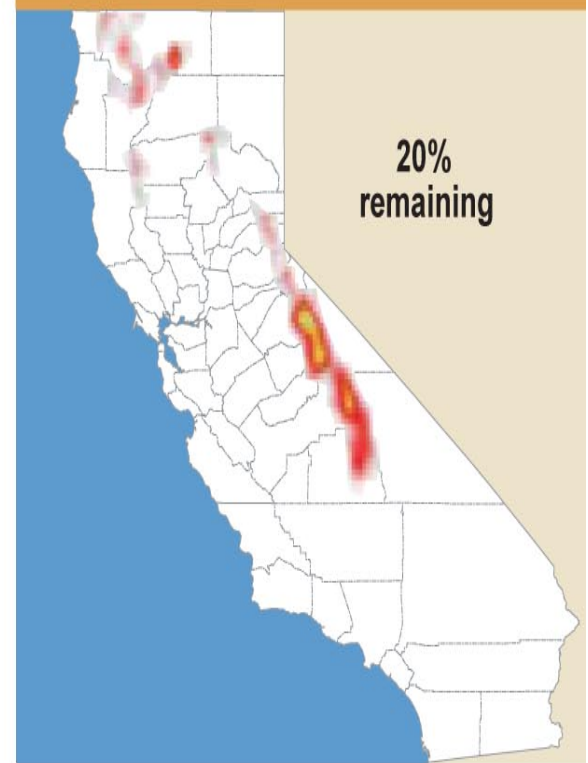


2070–2099

Lower Warming Range
Drier Climate



Medium Warming Range
Drier Climate



Source: Scripps 2006

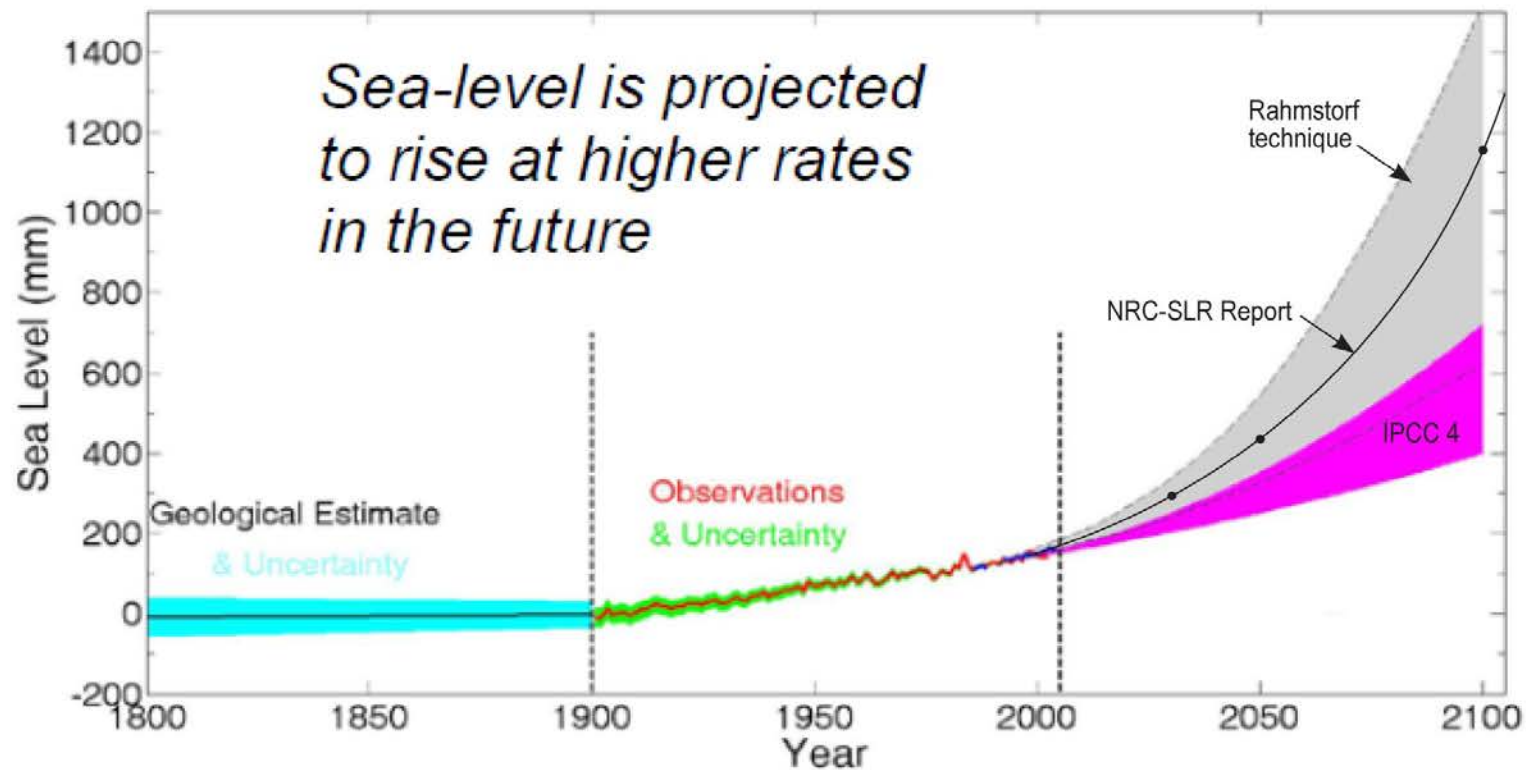


April 1 snow water content (inches)

Global sea-level is rising primarily because land ice is melting and ocean water expands as it warms.

1.7 mm per year over 20th century (from tide gages)

3.1 mm per year since 1993 (from satellites & tide gages)



Regional and Global Sea Level Rise Projections

(relative to the year 2000)

